Claims:

1. A composition for chemical mechanical polishing a metal, the composition comprising:

(a) a reagent comprising:

(i) a first moiety for oxidizing the metal; and

(ii) a second moiety for minimizing overetching the metal; and

(b) a stannate salt for stabilizing the composition.

2. The composition according to claim 1, wherein the first moiety is reduced to a complexing agent for the metal or oxidized metal.

3. The composition according to claim 3, wherein the first moiety comprises a peroxide group selected from the group of a peroxycarboxylic acid group, a peroxycarboxylate group, and combinations thereof, and the resulting complexing agent comprises a carboxylic acid or a carboxylate.

4. The composition according to claim 1, wherein the second moiety comprises an alkyl group, an alkyl group derivative, an aryl group, an aryl group derivative, or combinations thereof.

5. The composition according to claim 4, wherein the second moiety is selected from the group of polyethylene glycol, polyethylene glycol derivatives, benzene, benzene derivatives, and combinations thereof.

6. The composition according to claim 1, wherein the reagent comprises between about 0.005 wt.% and about 25 wt.% of the composition.

7. The composition according to claim 1, wherein the stannate salt comprises between about 0.1 ppm and about 20 ppm of the composition.

8. The composition according to claim 1, wherein the stannate salt is selected from the group of sodium stannate, potassium stannate, ammonium stannate, and combinations thereof.

9. The composition according to claim 2, further comprising a base in a sufficient amount to increase the solubility of the resulting complexing agent by forming a salt thereof.

10. The composition according to claim 9, wherein the base comprises ammonium hydroxide or potassium hydroxide to adjust the pH to about 7.

11. The composition according to claim 1, further comprising a corrosion inhibitor.

12. The composition according to claim 11, wherein the corrosion inhibitor is selected from the group of benzotriazole, imidazole, benzimidazole, benzothiazole, mercaptobenzotriazole, 5-methyl-1-benzotriazole, and combinations thereof.

13. The composition according to claim 11, wherein the corrosion inhibitor comprises between about 0.005 wt.% and about 0.05 wt.% of the composition.

14. The composition according to claim 1, further comprising abrasive particles at a concentration between about 0.1 wt.% and about 30 wt.% of the composition.

15. The composition according to claim 3, wherein the peroxycarboxylic acid group is selected from the group of peroxyacetic acid, peroxybenzoic acid, chlorobenzoic acid, peroxyformic acid, polyethylene glycol peroxy acid, and combinations thereof.

16. The composition according to claim 1, wherein the reagent comprises an amine-peroxy acid.

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17. A method of planarizing a substrate surface, the method comprising:

(a) applying a composition to a polishing pad, the composition comprising:

(i) a reagent comprising:

a first moiety for oxidizing the metal; and

a second moiety for minimizing overetching of a metal; and

(ii) a stannate salt for stabilizing the composition; and

(b) polishing the substrate surface with the composition.

18. The method according to claim 17, wherein the first moiety comprises a peroxide group selected from a group of a peroxycarboxylic acid group or a peroxycarboxylate group, wherein a reduced form of the first moiety comprises a complexing agent for the metal or oxidized metal selected from the group of a carboxylic acid, a carboxylate, and combinations thereof, and the second moiety comprises an alkyl group, an alkyl group derivative, an aryl group, an aryl group derivative, or combinations thereof.

19. The method according to claim 17, wherein the reagent comprises between about 0.005 wt.% and about 25 wt.% of the composition.

20. The method according to claim 17, wherein the stannate salt comprises between about 0.1 ppm and about 20 ppm of the composition.

21. The method according to claim 17, wherein the stannate salt is selected from the group of sodium stannate, potassium stannate, ammonium stannate, and combinations thereof.

22. The method according to claim 17, wherein the reagent comprises an amine-peroxy acid.

23. A method of planarizing a substrate surface, the method comprising:

(a) polishing a substrate surface using a first composition to selectively remove a metal layer relative to a barrier layer and a dielectric film; and

(b) polishing a substrate surface using a second composition to non-selectively remove the metal layer, the barrier layer, and the dielectric layer, the second composition comprising:

(i) a reagent comprising:

a first moiety for oxidizing the metal and for complexing with the metal or oxidized metal; and

a second moiety for minimizing overetching of the metal; and

(ii) a stannate salt for stabilizing the composition.

24. The method according to claim 23, wherein the second composition removes the dielectric layer and the metal layer and at a removal rate ratio of the dielectric layer to the metal layer of about 5:1 or less.

25. The method according to claim 23, wherein the second composition removes the barrier layer and the metal layer and at a removal rate ratio of the barrier layer to the metal layer of about 10:1 or less.

26. The method according to claim 23, wherein the reagent comprises between about 0.005 wt.% and about 25 wt.% of the composition and the stannate salt comprises between about 0.1 ppm and about 20 ppm of the composition.

27. A composition for chemical mechanical polishing a metal, the composition comprising:

(a) a reagent comprising:

(i) a first moiety comprising a peroxide group selected from the group of a peroxycarboxylic acid group, a peroxycarboxylate group, and combinations thereof; and

(ii) a second moiety comprising an alkyl group, an alkyl group derivative, an aryl group, an aryl group derivative, or combinations thereof; and

(b) a stannate salt.

28. The composition according to claim 27, wherein the peroxide group reduces to form a complexing agent comprising a carboxylic acid, a carboxylate, or combinations thereof.

29. The composition according to claim 27, wherein the reagent comprises between about 0.005 wt.% and about 25 wt.% of the composition.

30. The composition according to claim 27, wherein the stannate salt comprises between about 0.1 ppm and about 20 ppm of the composition, and wherein the stannate salt is selected from the group of sodium stannate, potassium stannate, ammonium stannate, and combinations thereof.

31. The composition according to claim 27, further comprising a base, a corrosion inhibitor, abrasive particles, or combinations thereof.

32. The composition according to claim 27, wherein the reagent comprises an amine-peroxy acid.